

What is claimed is:

1. A twisting apparatus for an ultrafine rectangular bar, comprising:
a chuck for holding a proximal end of the ultrafine rectangular bar;
chuck driving means for holding or releasing the proximal end of the ultrafine rectangular bar by driving the chuck;

at least two vise clamps structured to contact with and isolated from the ultrafine rectangular bar held by the chuck, each of the vise clamps having a pressing surface capable of contacting to a side surface of the ultrafine rectangular bar;

vise clamp driving means for driving the vise clamps to move the vise clamps to contact with and isolated from the ultrafine rectangular bar;

moving means for correlatively moving the chuck and the vise clamps along the axial center of the ultrafine rectangular bar held by the chuck; and

rotating means for correlatively rotating the chuck and the vise clamps around the axial center of the ultrafine rectangular bar held by the chuck,

wherein the chuck driving means and the vise clamp driving means are so controlled that, after the proximal end of the ultrafine rectangular bar is held by the chuck where the vise clamps are placed closely to the ultrafine rectangular bar, the chuck disengages ultrafine rectangular bar when the vise clamps contact to the ultrafine rectangular bar and then engages again the ultrafine rectangular bar, in a case where the vise clamps are approached closely to the ultrafine rectangular bar held by the chuck to twist the ultrafine rectangular bar upon isolating, as rotated correlatively, the chuck and the vise clamps from each other.

2. The twisting apparatus for an ultrafine rectangular bar according to claim 1, and further

comprising a stopper contacting to the distal end of the ultrafine rectangular bar at a prescribed position on the axial center of the ultrafine rectangular bar held by the chuck,

wherein the moving means, the chuck driving means, and the vise clamp driving means are so controlled that, where the vise clamp approaches closely and contacts to the ultrafine rectangular bar after the chuck holds the proximal end of the

ultrafine rectangular bar, the chuck disengages from the ultrafine rectangular bar, and the distal end of the ultrafine rectangular bar is made in contact with the stopper upon moving correlatively the chuck and the stopper.

3. The twisting apparatus for an ultrafine rectangular bar according to claim 1 or claim 2, wherein the twisting apparatus includes four vise clamps disposed so that a portion of a clamp surface for clamping a side surface of the ultrafine rectangular bar can be in contact with a portion of the adjacent vise clamp.

4. An endodontic instrument having a spiral groove manufactured by twisting an ultrafine rectangular bar, the endodontic instrument manufactured by a manufacturing method comprising the steps of:

holding a proximal end of the ultrafine rectangular bar with a chuck;

making approach at least two of vise clamps to a side surface of the ultrafine rectangular bar;

allowing rotation of the ultrafine rectangular bar by disengaging the chuck from the ultrafine rectangular bar when the vise clamps come in contact with the side surface of the ultrafine rectangular bar, to render a clamp surface of a distal end of the vise clamp in facial contact with a face of the side surface of the ultrafine rectangular bar;

holding the ultrafine rectangular bar again by the chuck; and

twisting the ultrafine rectangular bar in isolating the chuck from the vise clamps as correlatively rotating the chuck and the vise clamps.